

To Study the Association between Splenic Size and Grades of Oesophageal Varices in Patients of Cirrhosis of Liver with Portal Hypertension

B. P. Priyadarshi¹, Imran Kamal Khan², Vinay Kumar³, Ashok Kumar Verma⁴, Tanu Midha⁵, Madhuri⁶, Mahendra Singh⁷

¹Department of Medicine, Government Medical College, Kannauj, Uttar Pradesh, India. ²Department of Medicine, GSVM Medical College, Kanpur, Uttar Pradesh, India. ³Department of General Medicine, GSVM Medical College, Kanpur, Uttar Pradesh, India. ⁴Department of Radiology, GSVM Medical College, Kanpur, Uttar Pradesh, India. ⁵Department of Medicine, Government Medical College, Kannauj, Uttar Pradesh, India. ⁶Department of Cardiac Anaesthesia, GSVM Medical College, Kanpur, Uttar Pradesh, India. ⁷Department of Pathology, GSVM Medical College, Kanpur, Uttar Pradesh, India.

ABSTRACT

BACKGROUND

Chronic liver disease develops when the functional capacity of the liver is deranged, and it is not able to maintain normal physiological conditions. This study was carried to find out the association of portal vein size with gastro-oesophageal varices in diagnosed cases of cirrhosis of liver, so that this parameters can be used in predicting propensity to oesophageal varices non-invasively, and thus help in starting prophylactic therapy earlier to prevent bleeding and other complications of varices.

METHODS

100 patients previously or newly diagnosed with cirrhosis of liver with portal hypertension without history of hepatic encephalopathy, variceal bleeding, EVL, use of beta blockers, were included for the study. Ultrasonography was done in all cases to find out the spleen size. Routine blood testing including platelet count was done and UGI-Endoscopy was performed to see the presence of oesophageal varices of different grades. The data obtained was analysed using mean, SD, Student's t-test and chi square correlation coefficient. p Value of <0.05 was considered for significant.

RESULTS

Among 100 patients studied, 90% patients were found to have oesophageal varices. Based on endoscopic grading, incidence of grade 2 and grade 3 oesophageal varices predominated, accounting to 48% and 23 % respectively. On correlation of splenic diameter with grades of oesophageal varices, it was found that patients with splenic diameter >13 cm had higher grades of oesophageal varices i.e. 32 patients were grade 2 and 18 patients were grade 3, with $p < 0.001$ and was found highly significant.

CONCLUSIONS

In this study, we found that with increasing spleen size there are chances of formation of higher grades of oesophageal varices and both are also having positive association.

KEY WORDS

Cirrhosis of Liver, Spleen Size, Upper GI Endoscopy, Gastro-Oesophageal Varices

Corresponding Author:

Dr. Madhuri,

Flat No. 106,

Navsheel Motivihar Society,

Sarvodaya Nagar, Kanpur Nagar-208025,

Uttar Pradesh, India.

E-mail: priyadarshipb@yahoo.com

DOI: 10.14260/jemds/2020/220

Financial or Other Competing Interests:
None.

How to Cite This Article:

Priyadarshi BP, Khan IK, Kumar V, et al. To study the association between splenic size and grades of oesophageal varices in patients of cirrhosis of liver with portal hypertension. J. Evolution Med. Dent. Sci. 2020;9(13):1022-1025, DOI: 10.14260/jemds/2020/220

Submission 16-12-2019,

Peer Review 07-03-2020,

Acceptance 12-03-2020,

Published 30-03-2020.



BACKGROUND

Chronic liver disease develops when the functional capacity of the liver becomes deranged and it is not able to maintain normal physiological conditions. This study was carried to find out the association of portal vein size with gastro-oesophageal varices in diagnosed cases of cirrhosis of liver. So that these parameters can be used in predicting propensity to oesophageal varices non-invasively, and thus help in starting prophylactic therapy earlier to prevent bleeding and other complications of varices. Portal hypertension is the most common complication and also one of the important causes of death in chronic liver diseases. Increased resistance to portal blood flow due to alteration of the hepatic architecture leads to dilatation of portal vein, splenomegaly, and formation of oesophageal and gastric varices, variceal haemorrhage, ascites, hypersplenism, encephalopathy, etc.

In cirrhosis, increased intrahepatic vascular resistance is thought to be located mainly in the hepatic sinusoids¹. The rate of early re-bleeding translates into an increased rate of mortality. Therefore, the presence of oesophageal varices is considered a prognostic indicator and a factor affecting the morbidity and mortality of surgical procedures. Despite the advantages of endoscopy, it is still an unpleasant and expensive invasive method. It also carries the risk of bleeding due to manipulation. Ultrasound findings in portal system (portal vein diameter and spleen size) can predict both the presence of Varices and risk of Variceal bleeding. It can be used for diagnosis as well as long-term clinical monitoring of patients with portal hypertension. In view of the conflicting reports related to the non-invasive predictors for the presence of oesophageal varices in some studies.^{2,3}

Upper GI endoscopy is required to diagnose the gastro-oesophageal varices. This procedure is invasive, painful to the patient, and is not available in all centres. The splenic size can be measured by an easily available, painless, and non-invasive by ultrasonography (USG). This study was performed to find out the correlation between the splenic size with the development of gastro-oesophageal varices.

METHODS

This is a cross sectional study carried out among 100 patients of cirrhosis of liver with portal hypertension attending Gastroenterology, Medicine OPD and admitted in IPD, Department of Medicine, LLR & Associated Hospitals, GSVM Medical College, Kanpur during the period January 2018 - October 2019. The sample size was taken for conveniences. The study protocol was approved by the institutional ethics committee review board.

Inclusion Criteria

Previously diagnosed and newly diagnosed cases of cirrhosis of liver with portal hypertension.

Exclusion Criteria

- Patients suffering from hepatic encephalopathy
- With previous history of bleeding due to portal hypertension.

- Had treated or on treatment with beta blockers, diuretics or other vaso-active drugs. and
- With history of sclerotherapy or banding for oesophageal varices.

The history included occupation, alcohol intake, loss of appetite, history of jaundice, abdominal fullness, disorientation, unconsciousness, etc. A thorough clinical examination was done of all patients. Routine blood test including- LFT, Platelet count, PT/IN; Upper GI endoscopy; USG; Other investigations like – fibroscan and liver biopsy if required were performed. Spleen size measurement was done by using ultra-sonography by placing the patient in supine position, using 2-5 MHz curvilinear transducer in the coronal plane of section posteriorly in one of the lower left intercostal spaces. The average adult spleen measures 10-11cm in length. A maximum cephalo-caudal measurement exceeding 13 cm was taken as enlargement. Upper gastro-intestinal Endoscopy was performed in the department of Medicine, GSVM Medical College, Kanpur in all selected cases for gastro-oesophageal Varices and other associated signs of portal hypertension like red wale marks, cherry red spots.

In patients with two different types of variceal grades, the higher variceal grade was considered for our study-

1. Grade 1- Oesophageal varices of straight and small in size.
2. Grade 2- Oesophageal varices those are tortuous, enlarged and occupying less than one third of the lumen.
3. Grade 3- Oesophageal varices those are large and coil-shaped occupying more than one third of the lumen.
4. Grade 4- Oesophageal varices dilated, taut and occupy the entire oesophagus, mostly associated with presence of gastric or duodenal varices.

Statistical Analysis

The data obtained was analysed using mean, SD, Student's t-test and chi square correlation co-efficient. p value of <0.05 was considered to be significant.

RESULTS

In our study majority of patients belong to the age group of 40-49 years accounting for 35 % followed by 23% in the age group of 30-39 years. Among all the patients 85% were male and 15% of the patients were females. Approximately 90% of the patients were found to have oesophageal varices while no oesophageal varices were found in 10% of the patients. In 76% of the patients have portal vein size more than 13 mm while 24% of the patients have portal vein diameter less than or equal to 13 mm. About 48% of the patients were found to have grade 2 varices and 23% of the patients were found to have grade 3 varices while 19% of the patients were found to have grade 1 and no varices in 10 patients.

Splenic Diameter (cm)	No. of Patients	%
≤13	43	43.0
>13	57	57.0
Total	100	100.0
Table 1. Distribution Based on Diameter of Spleen		
About 57% of the patients have spleen diameter more than 13 cm while 43% of the patients have spleen diameter less than/equal to 13 cm.		

Grade of OV	No. of Patients	%
Nil	10	10.0
Grade 1	19	19.0
Grade 2	48	48.0
Grade 3	23	23.0
Total	100	100.0

Table 2. Distribution Based on Grade of Oesophageal Varices (OV)
In 48% of the patients were found to have grade 2 varices and 23% of the patients were found to have grade 3 varices while 19% of the patients were found to have grade 1 and no varices in 10 patients.

Varices	No. of Patients	Mean Age in Years	S.D.
Varices present	90	47.4	10.96
No varices	10	48.3	9.79

Table 3. Mean Age of the Patients
t=0.2486, p>0.05(.8041), inference= non-significant, L.L-U.L = -9.0 to + 0.89 (LL= lower limit, UL=upper limit).
Mean age of the patients having varices was 48.3 with standard deviation of 10.96 and was not found to be statistically significant.

Varices	No. of Patients	Mean Spleen Diameter	S.D.
Varices present	90	13.58	1.73
No varices	10	11.31	1.9

Table 4. Mean Spleen Diameter of the Patients
t=3.89, p<0.001, inference =highly significant
Mean spleen diameter of the patients having varices is 13.58 with standard deviation of 1.73 and was highly significant

Splenic Diameter (cm)	NIL	Grade 1	Grade 2	Grade 3
≤13	9	13	16	5
>13	1	6	32	18
Total	10	45	48	23

Table 5. Correlation of Splenic Diameter and Grades of Oesophageal Varices
χ²=20.09, df=3, p<0.001, inference=highly significant
From the above correlation it is evident that majority of the patients having higher grades of varices have spleen diameter above 13 mm, accounting grade 2 oesophageal varices in 32 patients and grade 3 oesophageal varices in total 18 patients.

DISCUSSION

We conducted our study with study sample consisting of 100 patients of whom 85 were males and 15 were females. Males contributed about 85% of the study population. Incidence of cirrhosis was maximum in the age group 40-49 years (35%). Overall mean age was 47.5±10.8. Mean age in patients with oesophageal varices was 47.4±10.96 as compared to 48.3±9.79 in patients without oesophageal varices.

However, mean age was 51 (range 20-80) in study by Baig et al,⁴ mean age was 42 (range 17-73) in a study by Cherian et al,⁵ and in study by Sarangapani et al⁶ median age was 45 (range 18-74). Youngest patient in our study was 24 years and oldest was 72 years. Males predominated in each of the age group studied. Among 100 patients studied 90% patients were found to have varices. 57% patients were found to have splenic diameter more than 13 cm as compared to 47% with 13 cm or less. Mean splenic diameter in patients with varices was 13.58±1.73 as compared to 11.32±1.9 in patients without varices.

Lopamudra Mandal et al⁷ (82 patients) reported that twenty patients were had no varices (grade 0) and the remaining sixty-two patients developed varices. Average spleen size of patients without gastro-oesophageal varices was 13.129 ± 1.102 cm and with varices 14.997 ± 1.992 cm. In the study by Prihatini et al,⁸ portal vein diameter 11.5 mm and spleen size of 10.3 cm were predictive factors for oesophageal varices in liver cirrhosis. Here, spleen size was smaller than our study, as well as portal vein diameter. Thomopoulos et al⁹ reported that the majority of patients with

gastro-oesophageal varices had spleen size of more than 13.5 cm which was nearly similar to our study.

Among 100 patients studied 90% patients were found to have oesophageal varices. Based on endoscopic grading, incidence of grade 2 and grade 3 oesophageal varices predominated, accounting to 48% and 23 % respectively. However, grade 1 varices accounted for 19% and varices were absent in 10% of cases. On correlation of splenic diameter with grades of oesophageal varices it was found that patients with splenic diameter >13 cm had higher grades of oesophageal varices accounting for 32 patients with grade 2 and 18 patients with grade 3, with p <0.001 and was highly significant.

Lopamudra Manda, I et al (2011)⁷ they concluded that in cirrhosis of liver with portal hypertension, without previous history of upper gastrointestinal bleeding; Spleen size increases with formation of gastro-oesophageal varices. There is also a positive correlation between the spleen size (r = 0.467) and gastro-oesophageal varices. Also, Serag Esmat et al (2011)¹⁰ who found that spleen size could be an independent factor for determining the risk of oesophageal and gastric varices. Splenic size of >131.5 mm and >131.29 mm were mostly associated with presence of oesophageal varices in patients of cirrhosis of liver. Nemichandra et al (2015)¹¹ they reported that there is a strong correlation between spleen size and the grade of oesophageal varices (r=0.6771), (p<0.001). In a study by Schepis et al¹² portal vein size of 13 mm was associated with higher grade oesophageal and gastric varices.

CONCLUSIONS

Large splenic diameter measured on ultrasound is associated with higher grades of oesophageal varices measured on UGIE in patients with liver cirrhosis with portal hypertension. This parameter can hence identify the subset of patients who require endoscopy for the prophylactic management of oesophageal varices. Apart from being non-invasive, splenic diameter is a relatively inexpensive test as abdominal ultrasound would be obtained on all cirrhotic patients routinely as a part of their clinical workup.

So, this parameter can be used in predicting propensity to oesophageal varices non-invasively and thus help in starting prophylactic therapy earlier to prevent bleeding and other complications of varices.

REFERENCES

- [1] Bosch J, Garcia-Pagan JC. Complications of cirrhosis. I. Portal hypertension. J Hepatol 2000;32(Suppl 1):141-56.
- [2] Sarwar S, Khan AA, Alam A, et al. Non-endoscopic prediction of presence of oesophageal varices in cirrhosis. J Coll Physicians Surg Pak 2005;15(9):528-31.
- [3] Dib N, Konate A, Obesti F, et al. Non-invasive diagnosis of portal hypertension in cirrhosis. Application to the primary prevention of varices. Gastroenterol Clin Biol 2005;9(10):975-87.

- [4] Baig WW, Nagaraja MV, Varma M, et al. Platelet count to spleen diameter ratio for the diagnosis of oesophageal varices: Is it feasible? *Can J Gastroenterol* 2008;22(10):825-8.
- [5] Cherian JV, Deepak N, Ponnusamy RP, et al. Non-invasive predictors of esophageal varices. *Saudi J Gastroenterol* 2011;17(1):64-8.
- [6] Sarangapani A, Shanmugam C, Kalyanasundaram M, et al. Non-invasive prediction of large esophageal varices in chronic liver disease patients. *Saudi J Gastroenterol* 2010;16(1):38-42.
- [7] Mandal L, Mandal SK, Bandyopadhyay D, et al. Correlation of portal vein diameter and splenic size with gastro-oesophageal varices in cirrhosis of liver. *JIACM* 2011;12(4):266-70.
- [8] Prihatini J, Lesmana LA, Manan C, et al. Detection of oesophageal varices in liver cirrhosis using non-invasive parameters. *Acta Med Indones* 2005;37(3):126-31.
- [9] Thomopoulos KC, Labropoulou-Karatza C, Mimidis KP, et al. Non-invasive predictors of the presence of large esophageal varices in patients with cirrhosis. *Digestive and Liver Disease* 2003;35(7):473-8.
- [10] Esmat S, Omran D. Study of non-invasive predictors of portal hypertension in liver cirrhotic Egyptian patients. *Journal of American Science* 2011;7(1):962-8.
- [11] Nemichandra, Salam KS, Kanse VY, et al. Non endoscopic predictors of esophageal varices in patients with cirrhosis of liver. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* 2015;14(1):65-8.
- [12] Schepis F, Cammà C, Niceforo D, et al. Which patients with cirrhosis should undergo endoscopic screening for esophageal varices detection? *Hepatology* 2001;33(2):333-8.